

SEQUENCE LISTING

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Wilken, Jill
Simon, Reyna
Kent, Stephen B.H.



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JAN 28 2000

<120> Modular Protein Libraries and Methods of Preparation

<130> GRFN-020/01US

<140> US 09/144,838

<141> 1998-08-31

<150> US 60/057,620

<151> 1997-09-04

<160> 54

<170> PatentIn Ver. 2.1

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20 25 30

Glu Gln Xaa Leu Ile Val Met Xaa Xaa Leu Ile Val Met Xaa Xaa Xaa
35 40 45

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Met Xaa Cys Leu Asp
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Tyr Thr Xaa Xaa Xaa Xaa Xaa Xaa Leu Ile Val Met Xaa Xaa Xaa Xaa

20 25 30

Leu Ile Val Met Phe Xaa Xaa Tyr Xaa Xaa Xaa Gly Ser Thr Asn Gly

35 40 45

Ser Thr Asn Xaa Xaa Cys Xaa Xaa Xaa Xaa Ser Ala Gly Leu Ile Val

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Met Xaa Xaa Phe Leu Xaa Xaa Xaa Xaa Arg Lys Thr Met Phe Xaa

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Ala Gly Ser Leu Val Ser Tyr Thr Pro Asn Ser Cys Cys Tyr Gly Phe

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Gln Gln His Pro Pro Pro Val Gln Ile Leu Lys Glu Trp Tyr Pro Thr

20 25 30

4

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Amstel

Ser Pro Ala Cys Pro Lys Pro Gly Val Ile Leu Leu Thr Lys Arg Gly
35 40 45

Arg Gln Ile Cys Ala Asp Pro Ser Lys Asn Trp Val Arg Gln Leu Met
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Gln Arg Leu Pro Ala Ile Ala
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Gly Asp Thr Leu Gly Ala Ser Trp His Arg Pro Asp Lys Cys Cys Leu
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Gly Tyr Gln Lys Arg Pro Leu Pro Gln Val Leu Leu Ser Ser Trp Tyr
20 25 30

Pro Thr Ser Gln Leu Cys Ser Lys Pro Gly Val Ile Phe Leu Thr Lys
35 40 45

Arg Gly Arg Gln Val Cys Ala Asp Lys Ser Lys Asp Trp Val Lys Lys
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Leu Met Gln Gln Leu Pro Val Thr Ala Arg
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Gln Gln His Pro Pro Val Gln Ile Leu Lys Glu Trp Tyr Pro Thr

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Ser Pro Ala Cys Ser Lys Pro Gly Val Ile Phe Leu Thr Lys Arg Gly
35 40 45

Arg Gln Val Cys Ala Asp Lys Ser Lys Asp Trp Val Lys Lys Leu Met
50 55 60

Gln Gln Leu Pro Val Thr Ala Arg
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Gly Tyr Gln Lys Arg Pro Leu Pro Gln Val Leu Leu Ser Ser Trp Tyr
20 25 30

Pro Thr Ser Gln Leu Cys Pro Lys Pro Gly Val Ile Leu Leu Thr Lys
35 40 45

Arg Gly Arg Gln Ile Cys Ala Asp Pro Ser Lys Asn Trp Val Arg Gln
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Leu Met Gln Arg Leu Pro Ala Ile Ala
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<400> 7
Met Asn Ala Lys Val Val Val Val Leu Val Leu Val Leu Thr Ala Leu
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Cys Leu Ser Asp Gly Lys Pro Val Ser Leu Ser Tyr Arg Cys Pro Cys
20 25 30

Arg Phe Phe Glu Ser His Val Ala Arg Ala Asn Val Lys His Leu Lys
35 40 45

Ile Leu Asn Thr Pro Asn Cys Ala Leu Gln Ile Val Ala Arg Leu Lys
50 55 60

Asn Asn Asn Arg Gln Val Cys Ile Asp Pro Lys Leu Lys Trp Ile Gln
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Glu Tyr Leu Glu Lys Ala Leu Asn Lys Arg Phe Lys Met
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Lys Pro Val Ser Leu Ser Tyr Arg Cys Pro Cys Arg Phe Phe Glu Ser
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His Val Ala Arg Ala Asn Val Lys His Leu Lys Ile Leu Asn Thr Pro
20 25 30

Asn Cys Ala Leu Gln Ile Val Ala Arg Leu Lys Asn Asn Asn Arg Gln
35 40 45

Val Cys Ile Asp Pro Lys Leu Lys Trp Ile Gln Glu Tyr Leu Glu Lys
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Ala Leu Asn

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B. J. Anstiss

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Met Lys Val Ser Ala Ala Arg Leu Ala Val Ile Leu Ile Ala Thr Ala
1 5 10 15

Leu Cys Ala Pro Ala Ser Ala Ser Pro Tyr Ser Ser Asp Thr Thr Pro
20 25 30

Cys Cys Phe Ala Tyr Ile Ala Arg Pro Leu Pro Arg Ala His Ile Lys
35 40 45

Glu Tyr Phe Tyr Thr Ser Gly Lys Cys Ser Asn Pro Ala Val Val Phe
50 55 60

Val Thr Arg Lys Asn Arg Gln Val Cys Ala Asn Pro Glu Lys Lys Trp
65 70 75 80

Val Arg Glu Tyr Ile Asn Ser Leu Glu Met Ser
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Ser Pro Tyr Ser Ser Asp Thr Thr Pro Cys Cys Phe Ala Tyr Ile Ala
1 5 10 15

Arg Pro Leu Pro Arg Ala His Ile Lys Glu Tyr Phe Tyr Thr Ser Gly
20 25 30

Lys Cys Ser Asn Pro Ala Val Val Phe Val Thr Arg Lys Asn Arg Gln
35 40 45

Val Cys Ala Asn Pro Glu Lys Lys Trp Val Arg Glu Tyr Ile Asn Ser
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Leu Glu Met Ser
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1 5 10 15

His Val Ala Arg Ala Asn Val Lys His Leu Lys Ile Leu Asn Thr Pro
20 25 30

Asn

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1 5 10 15

Val Ala Arg Ala Asn Val Lys His Leu Lys Ile Leu Asn Thr Pro Asn
20 25 30

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Arg Pro Leu Pro Arg Ala His Ile Lys Glu Tyr Phe Tyr Thr Ser Gly
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Lys

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Lys Pro Val Ser Leu Ser Tyr Arg Cys Cys Phe Ala Tyr Ile Ala Arg
1 5 10 15

Pro Leu Pro Arg Ala His Ile Lys Glu Tyr Phe Tyr Thr Ser Gly Lys
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Arg Pro Leu Pro Arg Ala His Ile Lys Glu Tyr Phe Tyr Thr Ser Gly
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Ser Pro Tyr Ser Ser Asp Thr Thr Pro Cys Pro Cys Phe Ala Tyr Ile
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Ala Arg Pro Leu Pro Arg Ala His Ile Lys Glu Tyr Phe Tyr Thr Ser
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Ser Pro Tyr Ser Ser Asp Thr Thr Pro Cys Cys Arg Phe Phe Glu Ser
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His Val Ala Arg Ala Asn Val Lys His Leu Lys Ile Leu Asn Thr Pro
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Asn

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Ser Pro Tyr Ser Ser Asp Thr Thr Pro Cys Pro Cys Arg Phe Phe Glu
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Ser His Val Ala Arg Ala Asn Val Lys His Leu Lys Ile Leu Asn Thr
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Cys Ala Leu Gln Ile Val Ala Arg Leu Lys Asn Asn Asn Arg Gln Val
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Cys Ile Asp Pro Lys Leu Lys Trp Ile Gln Glu Tyr Leu Glu Lys Ala
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Leu Asn

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Cys Ala Asn Pro Glu Lys Lys Trp Val Arg Glu Tyr Ile Asn Ser Leu
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Cys Ser Asn Pro Ala Val Val Phe Val Thr Arg Lys Asn Arg Gln Val
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Cys Ile Asp Pro Lys Leu Lys Trp Ile Gln Glu Tyr Leu Glu Lys Ala
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Leu Asn

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Cys Ser Asn Pro Ala Val Val Phe Val Thr Arg Lys Asn Arg Gln Val
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Cys Ala Asn Pro Glu Lys Lys Trp Val Arg Glu Tyr Ile Asn Ser Leu
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Glu Met Ser

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1 5 10 15

His Val Ala Arg Ala Asn Val Lys His Leu Lys Ile Leu Asn Thr Pro

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Asn Cys Ala Leu Gln Ile Val Ala Arg Leu Lys Asn Asn Asn Arg Gln
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Val Cys Ile Asp Pro Lys Leu Lys Trp Ile Gln Glu Tyr Leu Glu Lys
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Ala Leu Asn
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1 5 10 15

His Val Ala Arg Ala Asn Val Lys His Leu Lys Ile Leu Asn Thr Pro
20 25 30

Asn Cys Ala Leu Gln Ile Val Ala Arg Leu Lys Asn Asn Asn Arg Gln
35 40 45

Val Cys Ala Asn Pro Glu Lys Lys Trp Val Arg Glu Tyr Ile Asn Ser
50 55 60

Leu Glu Met Ser
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Lys Pro Val Ser Leu Ser Tyr Arg Cys Pro Cys Arg Phe Phe Glu Ser
1 5 10 15

His Val Ala Arg Ala Asn Val Lys His Leu Lys Ile Leu Asn Thr Pro
20 25 30

Asn Cys Ser Asn Pro Ala Val Val Phe Val Thr Arg Lys Asn Arg Gln
35 40 45

Val Cys Ile Asp Pro Lys Leu Lys Trp Ile Gln Glu Tyr Leu Glu Lys
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Ala Leu Asn
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1 5 10 15

His Val Ala Arg Ala Asn Val Lys His Leu Lys Ile Leu Asn Thr Pro
20 25 30

Asn Cys Ser Asn Pro Ala Val Val Phe Val Thr Arg Lys Asn Arg Gln
35 40 45

Val Cys Ala Asn Pro Glu Lys Lys Trp Val Arg Glu Tyr Ile Asn Ser
50 55 60

Leu Glu Met Ser
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<400> 27

Lys Pro Val Ser Leu Ser Tyr Arg Cys Cys Arg Phe Phe Glu Ser His
1 5 10 15

Val Ala Arg Ala Asn Val Lys His Leu Lys Ile Leu Asn Thr Pro Asn
20 25 30

Cys Ala Leu Gln Ile Val Ala Arg Leu Lys Asn Asn Asn Arg Gln Val
35 40 45

Cys Ile Asp Pro Lys Leu Lys Trp Ile Gln Glu Tyr Leu Glu Lys Ala
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Leu Asn
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Val Ala Arg Ala Asn Val Lys His Leu Lys Ile Leu Asn Thr Pro Asn
20 25 30

Cys Ala Leu Gln Ile Val Ala Arg Leu Lys Asn Asn Asn Arg Gln Val
35 40 45

Cys Ala Asn Pro Glu Lys Lys Trp Val Arg Glu Tyr Ile Asn Ser Leu
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Glu Met Ser
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Lys Pro Val Ser Leu Ser Tyr Arg Cys Cys Arg Phe Phe Glu Ser His
1 5 10 15

Val Ala Arg Ala Asn Val Lys His Leu Lys Ile Leu Asn Thr Pro Cys
20 25 30

Asn Ser Asn Pro Ala Val Val Phe Val Thr Arg Lys Asn Arg Gln Val
35 40 45

Cys Ile Asp Pro Lys Leu Lys Trp Ile Gln Glu Tyr Leu Glu Lys Ala
50 55 60

Leu Asn

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1 5 10 15

Val Ala Arg Ala Asn Val Lys His Leu Lys Ile Leu Asn Thr Pro Asn
20 25 30

Cys Ser Asn Pro Ala Val Val Phe Val Thr Arg Lys Asn Arg Gln Val
35 40 45

Cys Ala Asn Pro Glu Lys Lys Trp Val Arg Glu Tyr Ile Asn Ser Leu
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Glu Met Ser

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1 5 10 15

Arg Pro Leu Pro Arg Ala His Ile Lys Glu Tyr Phe Tyr Thr Ser Gly
20 25 30

Lys Cys Ala Leu Gln Ile Val Ala Arg Leu Lys Asn Asn Asn Arg Gln
35 40 45

Val Cys Ile Asp Pro Lys Leu Lys Trp Ile Gln Glu Tyr Leu Glu Lys
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Ala Leu Asn

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1 5 10 15

Arg Pro Leu Pro Arg Ala His Ile Lys Glu Tyr Phe Tyr Thr Ser Gly
20 25 30

Lys Cys Ala Leu Gln Ile Val Ala Arg Leu Lys Asn Asn Asn Arg Gln
35 40 45

Val Cys Ala Asn Pro Glu Lys Lys Trp Val Arg Glu Tyr Ile Asn Ser
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Leu Glu Met Ser

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Arg Pro Leu Pro Arg Ala His Ile Lys Glu Tyr Phe Tyr Thr Ser Gly
20 25 30

Lys Cys Ser Asn Pro Ala Val Val Phe Val Thr Arg Lys Asn Arg Gln
35 40 45

Val Cys Ile Asp Pro Lys Leu Lys Trp Ile Gln Glu Tyr Leu Glu Lys
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Arg Pro Leu Pro Arg Ala His Ile Lys Glu Tyr Phe Tyr Thr Ser Gly
20 25 30

Lys Cys Ser Asn Pro Ala Val Val Phe Val Thr Arg Lys Asn Arg Gln
35 40 45

Val Cys Ala Asn Pro Glu Lys Lys Trp Val Arg Glu Tyr Ile Asn Ser
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Pro Leu Pro Arg Ala His Ile Lys Glu Tyr Phe Tyr Thr Ser Gly Lys
20 25 30

Cys Ala Leu Gln Ile Val Ala Arg Leu Lys Asn Asn Asn Arg Gln Val
35 40 45

Cys Ile Asp Pro Lys Leu Lys Trp Ile Gln Glu Tyr Leu Glu Lys Ala
50 55 60

Leu Asn
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Pro Leu Pro Arg Ala His Ile Lys Glu Tyr Phe Tyr Thr Ser Gly Lys
20 25 30

Cys Ala Leu Gln Ile Val Ala Arg Leu Lys Asn Asn Asn Arg Gln Val
35 40 45

Cys Ala Asn Pro Glu Lys Lys Trp Val Arg Glu Tyr Ile Asn Ser Leu
50 55 60

Glu Met Ser
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1 5 10 15

Pro Leu Pro Arg Ala His Ile Lys Glu Tyr Phe Tyr Thr Ser Gly Lys
20 25 30

Cys Ser Asn Pro Ala Val Val Phe Val Thr Arg Lys Asn Arg Gln Val
35 40 45

Cys Ile Asp Pro Lys Leu Lys Trp Ile Gln Glu Tyr Leu Glu Lys Ala
50 55 60

Leu Asn
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Lys Pro Val Ser Leu Ser Tyr Arg Cys Cys Phe Ala Tyr Ile Ala Arg
1 5 10 15

Pro Leu Pro Arg Ala His Ile Lys Glu Tyr Phe Tyr Thr Ser Gly Lys
20 25 30

Cys Ser Asn Pro Ala Val Val Phe Val Thr Arg Lys Asn Arg Gln Val
35 40 45

Cys Ala Asn Pro Glu Lys Lys Trp Val Arg Glu Tyr Ile Asn Ser Leu
50 55 60

Glu Met Ser

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<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic

<400> 39
Ser Pro Tyr Ser Ser Asp Thr Thr Pro Cys Cys Phe Ala Tyr Ile Ala
1 5 10 15

Arg Pro Leu Pro Arg Ala His Ile Lys Glu Tyr Phe Tyr Thr Ser Gly
20 25 30

Lys Cys Ala Leu Gln Ile Val Ala Arg Leu Lys Asn Asn Asn Arg Gln
35 40 45

Val Cys Ile Asp Pro Lys Leu Lys Trp Ile Gln Glu Tyr Leu Glu Lys
50 55 60

Ala Leu Asn
65

<210> 40
<211> 68
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic

<400> 40
Ser Pro Tyr Ser Ser Asp Thr Thr Pro Cys Cys Phe Ala Tyr Ile Ala
1 5 10 15

Arg Pro Leu Pro Arg Ala His Ile Lys Glu Tyr Phe Tyr Thr Ser Gly
20 25 30

Lys Cys Ala Leu Gln Ile Val Ala Arg Leu Lys Asn Asn Asn Arg Gln
35 40 45

Val Cys Ala Asn Pro Glu Lys Lys Trp Val Arg Glu Tyr Ile Asn Ser
50 55 60

Leu Glu Met Ser

65

<210> 41

<211> 67

<212> PRT

<213> Artificial Sequence

B
G

<220>

<223> Description of Artificial Sequence: Synthetic

<400> 41

Ser Pro Tyr Ser Ser Asp Thr Thr Pro Cys Cys Phe Ala Tyr Ile Ala
1 5 10 15

Arg Pro Leu Pro Arg Ala His Ile Lys Glu Tyr Phe Tyr Thr Ser Gly
20 25 30

Lys Cys Ser Asn Pro Ala Val Val Phe Val Thr Arg Lys Asn Arg Gln
35 40 45

Val Cys Ile Asp Pro Lys Leu Lys Trp Ile Gln Glu Tyr Leu Glu Lys
50 55 60

Ala Leu Asn

65

<210> 42

<211> 68

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Synthetic

<400> 42

Ser Pro Tyr Ser Ser Asp Thr Thr Pro Cys Cys Phe Ala Tyr Ile Ala
1 5 10 15

Arg Pro Leu Pro Arg Ala His Ile Lys Glu Tyr Phe Tyr Thr Ser Gly
20 25 30

Lys Cys Ser Asn Pro Ala Val Val Phe Val Thr Arg Lys Asn Arg Gln
35 40 45

Val Cys Ala Asn Pro Glu Lys Lys Trp Val Arg Glu Tyr Ile Asn Ser
50 55 60

Leu Glu Met Ser
65

<210> 43
<211> 68
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic

<400> 43
Ser Pro Tyr Ser Ser Asp Thr Thr Pro Cys Pro Cys Phe Ala Tyr Ile
1 5 10 15

Ala Arg Pro Leu Pro Arg Ala His Ile Lys Glu Tyr Phe Tyr Thr Ser
20 25 30

Gly Lys Cys Ala Leu Gln Ile Val Ala Arg Leu Lys Asn Asn Asn Arg
35 40 45

Gln Val Cys Ile Asp Pro Lys Leu Lys Trp Ile Gln Glu Tyr Leu Glu
50 55 60

Lys Ala Leu Asn
65

<210> 44
<211> 69
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic

<400> 44
Ser Pro Tyr Ser Ser Asp Thr Thr Pro Cys Pro Cys Phe Ala Tyr Ile
1 5 10 15

Ala Arg Pro Leu Pro Arg Ala His Ile Lys Glu Tyr Phe Tyr Thr Ser
20 25 30

Gly Lys Cys Ala Leu Gln Ile Val Ala Arg Leu Lys Asn Asn Asn Arg

35

40

45

Gln Val Cys Ala Asn Pro Glu Lys Lys Trp Val Arg Glu Tyr Ile Asn
50 55 60

Ser Leu Glu Met Ser
65

(B)
<210> 45
<211> 68
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic

<400> 45
Ser Pro Tyr Ser Ser Asp Thr Thr Pro Cys Pro Cys Phe Ala Tyr Ile
1 5 10 15

Ala Arg Pro Leu Pro Arg Ala His Ile Lys Glu Tyr Phe Tyr Thr Ser
20 25 30

Gly Lys Cys Ser Asn Pro Ala Val Val Phe Val Thr Arg Lys Asn Arg
35 40 45

Gln Val Cys Ile Asp Pro Lys Leu Lys Trp Ile Gln Glu Tyr Leu Glu
50 55 60

Lys Ala Leu Asn
65

<210> 46
<211> 69
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic

<400> 46
Ser Pro Tyr Ser Ser Asp Thr Thr Pro Cys Pro Cys Phe Ala Tyr Ile
1 5 10 15

Ala Arg Pro Leu Pro Arg Ala His Ile Lys Glu Tyr Phe Tyr Thr Ser
20 25 30

Gly Lys Cys Ser Asn Pro Ala Val Val Phe Val Thr Arg Lys Asn Arg
35 40 45

Gln Val Cys Ala Asn Pro Glu Lys Lys Trp Val Arg Glu Tyr Ile Asn
50 55 60

Ser Leu Glu Met Ser
65

(B)
<210> 47
<211> 67
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic

<400> 47
Ser Pro Tyr Ser Ser Asp Thr Thr Pro Cys Cys Arg Phe Phe Glu Ser
1 5 10 15

His Val Ala Arg Ala Asn Val Lys His Leu Lys Ile Leu Asn Thr Pro
20 25 30

Asn Cys Ala Leu Gln Ile Val Ala Arg Leu Lys Asn Asn Asn Arg Gln
35 40 45

Val Cys Ile Asp Pro Lys Leu Lys Trp Ile Gln Glu Tyr Leu Glu Lys
50 55 60

Ala Leu Asn
65

<210> 48
<211> 68
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic

<400> 48
Ser Pro Tyr Ser Ser Asp Thr Thr Pro Cys Cys Arg Phe Phe Glu Ser
1 5 10 15

His Val Ala Arg Ala Asn Val Lys His Leu Lys Ile Leu Asn Thr Pro
20 25 30

Asn Cys Ala Leu Gln Ile Val Ala Arg Leu Lys Asn Asn Asn Arg Gln
35 40 45

Val Cys Ala Asn Pro Glu Lys Lys Trp Val Arg Glu Tyr Ile Asn Ser
50 55 60

Leu Glu Met Ser
65

B
<210> 49

<211> 67

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Synthetic

<400> 49

Ser Pro Tyr Ser Ser Asp Thr Thr Pro Cys Cys Arg Phe Phe Glu Ser
1 5 10 15

His Val Ala Arg Ala Asn Val Lys His Leu Lys Ile Leu Asn Thr Pro
20 25 30

Asn Cys Ser Asn Pro Ala Val Val Phe Val Thr Arg Lys Asn Arg Gln
35 40 45

Val Cys Ile Asp Pro Lys Leu Lys Trp Ile Gln Glu Tyr Leu Glu Lys
50 55 60

Ala Leu Asn
65

<210> 50

<211> 68

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Synthetic

<400> 50

Ser Pro Tyr Ser Ser Asp Thr Thr Pro Cys Cys Arg Phe Phe Glu Ser

1

5

10

15

His Val Ala Arg Ala Asn Val Lys His Leu Lys Ile Leu Asn Thr Pro
20 25 30

Asn Cys Ser Asn Pro Ala Val Val Phe Val Thr Arg Lys Asn Arg Gln
35 40 45

Val Cys Ala Asn Pro Glu Lys Lys Trp Val Arg Glu Tyr Ile Asn Ser
50 55 60

Leu Glu Met Ser
65

<210> 51

<211> 68

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Synthetic

<400> 51

Ser Pro Tyr Ser Ser Asp Thr Thr Pro Cys Pro Cys Arg Phe Phe Glu
1 5 10 15

Ser His Val Ala Arg Ala Asn Val Lys His Leu Lys Ile Leu Asn Thr
20 25 30

Pro Asn Cys Ala Leu Gln Ile Val Ala Arg Leu Lys Asn Asn Asn Arg
35 40 45

Gln Val Cys Ile Asp Pro Lys Leu Lys Trp Ile Gln Glu Tyr Leu Glu
50 55 60

Lys Ala Leu Asn
65

<210> 52

<211> 69

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Synthetic

<400> 52

Ser Pro Tyr Ser Ser Asp Thr Thr Pro Cys Pro Cys Arg Phe Phe Glu
1 5 10 15

Ser His Val Ala Arg Ala Asn Val Lys His Leu Lys Ile Leu Asn Thr
20 25 30

Pro Asn Cys Ala Leu Gln Ile Val Ala Arg Leu Lys Asn Asn Asn Arg
35 40 45

Gln Val Cys Ala Asn Pro Glu Lys Lys Trp Val Arg Glu Tyr Ile Asn
50 55 60

Ser Leu Glu Met Ser
65

<210> 53

<211> 68

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Synthetic

<400> 53

Ser Pro Tyr Ser Ser Asp Thr Thr Pro Cys Pro Cys Arg Phe Phe Glu
1 5 10 15

Ser His Val Ala Arg Ala Asn Val Lys His Leu Lys Ile Leu Asn Thr
20 25 30

Pro Asn Cys Ser Asn Pro Ala Val Val Phe Val Thr Arg Lys Asn Arg
35 40 45

Gln Val Cys Ile Asp Pro Lys Leu Lys Trp Ile Gln Glu Tyr Leu Glu
50 55 60

Lys Ala Leu Asn
65

<210> 54

<211> 69

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Synthetic

<400> 54

Ser Pro Tyr Ser Ser Asp Thr Thr Pro Cys Pro Cys Arg Phe Phe Glu
1 5 10 15

Ser His Val Ala Arg Ala Asn Val Lys His Leu Lys Ile Leu Asn Thr
 20 25 30

Pro Asn Cys Ser Asn Pro Ala Val Val Phe Val Thr Arg Lys Asn Arg
 35 40 45

Gln Val Cys Ala Asn Pro Glu Lys Lys Trp Val Arg Glu Tyr Ile Asn
 50 55 60

Ser Leu Glu Met Ser

65